Vegetation Dynamics in Nech Sar National park, South Ethiopia Rift Valley

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Abstract

Set in the Southern Ethiopia Rift valley, Nech Sar National park, has extraordinary landscapes. The park shows important land cover changes over the years. The primary aim of this study was to understand the land use/land cover changes that occurred between 1976 and 2013 in Nech Sar National park (NSNP) and determine the intensity of the spatial and temporal changes of the habitat. The study examines the historical land use/ land cover changes and the possible causes using GIS and Remote sensing. The NSNP consists of nine land cover classes (Lake Abaya; Lake Chamo; Open grassland; Riparian and Groundwater forest; Bushy shrubby grassland; Wooded grassland; Dense bush land; Bare land, cultivated and heavily degraded land; and Wetlands). Landsat images with a 30m resolution of 1976, 1986, 2000, 2005, 2011 obtained from NASA and United States Geological Survey (USGS) were used. The intensity of changes through time was analyzed using three level analysis suggested by Aldwaik and Pontius (2012). The study results show that the land cover of NSNP underwent major changes since 1976. Bare and cultivated land; wooded grassland; wetlands; riparian and groundwater forest and open grassland have showed major net changes. The two major tropical lakes, Lake Abaya and Lake Chamo show dramatic change since 1976. Lake Abaya has net gained of 220 ha due to inflow of high sedimentation from the uplands and the outflow of the lake has been blocked by levees. However, Lake Chamo has decreased with 139 ha due to diversion of its tributary rivers for irrigation. Bare and cultivated lands have net increased with 4382 ha, and wooded grassland with 1713 ha. Open grassland has net decreased with 1402 ha and riparian and ground water forests have net decreased with 1556 ha. The riparian and groundwater forests near the Sermale river showed substantial decrease over the years. The wetlands also showed a net decrease with 2148 ha over the years. The intensity of changes were much faster from 2005-2011 than the time interval of 1986-2000. The general increase in bare, cultivated and heavily degraded lands and woodlands at the expense of wetlands, open grasslands, riparian and groundwater forest has negatively affected the survival of wildlife and the international value of the park. Therefore, the management plan strategy and its action should be prioritized based on the activity and intensity of changes of landscape.

Keywords: land-use/cover change, land cover dynamics, NechSar National Park, GIS and remote sensing, degradation, vegetation cover